

Application No. 09/967,027

REMARKS

The above-identified patent application has been reviewed in light of the Examiner's Action dated April 30, 2004. Claims 5, 11, 12, 14-17, 21 and 23 have been amended without intending to abandon or to dedicate to the public any patentable subject matter. No claims have been canceled. Therefore, Claims 1-24 are now pending. As set out more fully below, reconsideration and withdrawal of the objections to and rejections of the claims are respectfully requested.

The abstract of the disclosure stands objected to because it exceeds 150 words. In the amendments set forth above, a revised Abstract having less than 150 words is presented. Accordingly, Applicant requests that the objection to the Abstract be reconsidered and withdrawn.

Claim 5 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. In particular, the Office Action finds that Claim 5 is vague and indefinite because it is unclear as to how the recited third and fourth data buses are connected to the rest of the claimed features. In the amendments set forth above, Claim 5 has been amended to address this rejection. In addition, Applicant notes that the Office Action indicates that Claim 5 would be allowable if so amended. Accordingly, reconsideration and withdrawal of the rejection of Claim 5 are respectfully requested.

Claims 11 and 21 stand rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent No. 6,272,533 to Browne ("Browne") in view of U.S. Patent No. 5,530,842 to Abraham et al. ("Abraham"), and Claim 22 stands rejected under 35 U.S.C. §103 as being unpatentable over Browne in view of Abraham and further in view of U.S. Patent No. 6,243,829 to Chen ("Chen"). In order to establish a prima facie case of obviousness under Section 103, there must be some suggestion or motivation to modify the reference or to combine the reference teachings, there must be a reasonable expectation of success, and the prior art reference or references must teach or suggest all of the claim limitations. (MPEP §2143.) As explained in detail below, each and every element of the invention as set forth in the claims cannot be found in the cited references,

Application No. 09/967,027

whether those references are considered alone or in combination. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. §103 are respectfully requested.

The present invention is directed to bus zoning in a channel independent storage controller architecture. Zoning may be achieved by enabling a first switched path that is interconnected to a first controller memory module, and disabling a second switched path that is interconnected to a second channel memory module. In addition, a passive backplane having at least first and second data buses completes the connection between the first switched path and the first controller memory module and the second switched path and the second controller memory module respectively. As recited by some of the claims, in operation, data passed to a controller memory module is modified by that module, and then may be returned to the channel interface module as modified data. If failure of a component is detected, the active switched path can be changed. Accordingly, redundancy can be provided by the present invention. In addition, components can be swapped without requiring that the entire system be taken down.

Claim 11 is generally directed to a method for zoning a controller memory module to a channel interface module. According to the method, a first channel interface module having a first switched path and a second switched path is provided. The first switched path is connected to a first controller memory module using a passive backplane and the second switched path is connected to a second controller memory module using the passive backplane. Claim 11 further provides enabling the first switched path and disabling the second switched path. Furthermore, as amended, Claim 11 recites sending data to the first controller memory module over the first switched path and the passive backplane, wherein the data is modified by the first controller memory module. Amended Claim 11 further recites receiving modified data from the first controller memory module over the first switched path and the passive backplane.

Claim 21 is generally directed to an apparatus in which a channel interface module is associated with a particular controller memory module. The apparatus recited by Claim 21 includes "at least a first channel interface module having a first switched path and a second switched path; a passive backplane; [and] a first controller memory module connected to said

Application No. 09/967,027

first switched path using a first bus included in said passive backplane." In addition, amended Claim 21 specifies that the first controller memory module is "operable to form modified data received from said at least a first channel interface module over said first switched path and to return modified data to said at least a first channel interface module over said first switched path." Furthermore, amended Claim 21 recites:

a second controller memory module selectively connected to said second switched path using a second bus included in said passive backplane, said second controller memory module operable to form modified data received from said at least a first channel interface module over said second switched path and to return modified data to said at least a first channel interface module over said second switched path, wherein a first one of said first switched path and said second switched path is disabled when a second one of said first switched path and said second switched path is enabled.

The Browne reference is generally directed to a secure computer system that includes a standalone switch operable to inhibit data corruption on a storage device. In particular, Browne discusses hardware for selectively disabling alteration of data residing on a mass storage device that is subject to remote access. (Browne Abstract.) To that end, Browne discusses the use of a switch 206 to selectively enable access to data storage 110 by a processor 104a associated with a local system bus 102a and/or a processor 104b associated with a second local system bus 102b associated with remote access. (Browne Fig. 7, col. 10, ll. 56-67.) More particularly, in response to a command to support remote access, the SCSI controller 108c associated with the first local system bus 102a is disconnected, and the SCSI controller 108b associated with the second bus 102b is connected to the data storage 110 subject to preprogrammed operating mode limitations. (*Id.*) These limitations may include inhibiting write operations while allowing read operations with respect to a hard disk drive. The Browne reference does not teach, suggest or describe sending data to a first controller memory module over a first switched path wherein the data is modified by the first controller memory module. In addition, Browne does not discuss receiving modified data from the first controller memory module over the first switched path. Instead, Browne discusses writing data to or reading data from hard disk drives. Furthermore, because

Application No. 09/967,027

the components discussed by Browne identified in the Office Action as corresponding to the channel interface module comprise a switch that selectively connects two SCSI controllers to a storage device, Browne does not teach, suggest or disclose modifying data in a controller memory module as recited by Claims 11 and 21.

The Office Action acknowledges that the Browne reference does not discuss the use of a passive backplane. In order to provide a passive backplane, reference is made to the Abraham patent. Even if the proposed combination of the Abraham and Browne references is proper, such a combination does not provide each and every element of Claims 11 and 21. In particular, the Abraham reference, which is directed to a generic backplane system to allow the use of multiple LAN protocols simultaneously (Abraham Abstract), does not provide the elements discussed above that are not taught, suggested or disclosed by Browne. Accordingly, for at least these reasons, the rejection of Claims 11 and 21 as obvious should be reconsidered and withdrawn.

The Office Action cites the Chen reference for disclosing disabling a first switched path and enabling a second switched path in case the first controller fails in connection with Claim 22. However, even if the proposed combination of the Abraham, Browne and Chen references is proper, such a combination does not provide each and every element of Claim 22. In particular, the Chen reference, which is directed to providing a controller supporting redundant synchronous memories (Chen Abstract) does not provide the elements discussed above that are not taught, suggested or disclosed by the other references. Accordingly, for at least these reasons, the rejection of Claim 22 should be reconsidered and withdrawn.

Applicant notes with appreciation the Examiner's indication that Claims 1-4 and 6-10 are allowed.

Claims 12-20, 23 and 24 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. In the amendments set forth above, Claims 12, 15, 16, 17 and 23 have been rewritten in independent form. As a result of these amendments, it is submitted that Claims 12-20, 23 and 24 no longer depend from a rejected base claim.

Application No. 09/967,027

Accordingly, reconsideration and withdrawal of the objections to Claims 12-20, 23 and 24 are respectfully requested.

The application now appearing to be in form for allowance, early notification of same is respectfully requested. The Examiner is invited to contact the undersigned by telephone if doing so would expedite the resolution of this case.

Respectfully submitted,

SHERIDAN ROSS P.C.

By: 

Bradley M. Knepper
Registration No. 44,189
1560 Broadway, Suite 1200
Denver, CO 80202-5141
(303) 863-9700

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